

What is claimed is:

1. A method for automatically configuring a first gain and a second gain of a repeater in a telecommunications system, the repeater operable to receive data from a transceiver via a downlink channel associated with the first gain and to send data to the transceiver via an uplink channel associated with the second gain, the method comprising:

sampling a power level of the downlink channel;
comparing the sampled power level to a reference power level;
adjusting the first gain so that the sampled power level is within a predetermined range of the reference power level; and
adjusting the second gain to equal the first gain, so that a balance can be automatically achieved between a coverage area of the repeater and a level of noise associated with the uplink channel.

2. The method of claim 1 further including selecting the reference power level to control the level of noise associated with the uplink channel.

3. The method of claim 1 wherein the sampled power level is the power level of a pilot signal.

4. The method of claim 3 further including demodulating the pilot signal.

5. The method of claim 1 further including:
comparing an initial downlink channel gain with an initial uplink channel gain; and
altering at least one of the initial gains, so that the initial gains fall within a predetermined range relative to one another.

6. The method of claim 5 wherein the downlink channel uses a first frequency and the uplink channel uses a second frequency.

7. The method of claim 6 further including converting either the first frequency into the second frequency or the second frequency

1000
900
800
700
600
500
400
300
200
100

into the first frequency so that the first and second frequencies can be compared.

8. The method of claim 1 further including comparing the first gain to a minimum repeater gain and a maximum repeater gain to determine whether the first gain is greater than the minimum repeater gain and less than the maximum repeater gain, the comparison ensuring that the repeater is capable of supporting the first gain.

9. The method of claim 1 further including scaling a plurality of other signals on the downlink channel with the first gain.

10. The method of claim 1 further including defining an upper and lower limit associated with the first gain, so that the second gain is considered equal to the first gain if the second gain is within the upper and lower limits.

11. A method for automatically adjusting a first gain and a second gain in a repeater, the repeater operable to communicate with a transceiver in a telecommunications system via a downlink channel associated with the first gain and an uplink channel associated with the second gain, the method comprising:

receiving a signal from the transceiver via the downlink channel;
sampling the received signal to obtain a power level;

comparing the sampled power level to a reference power level to determine whether the sampled power level falls within a predefined range of the reference power level;

incrementally adjusting the first gain so that the sampled power level is within the predetermined range; and

adjusting the second gain so that the second gain is within a predefined range of the first gain.

12. The method of claim 11 further including selecting the reference power level so that a level of noise associated with the uplink channel remains below a predetermined maximum noise level.

13. The method of claim 11 further including balancing the first and second gains before sampling the received signal.

14. The method of claim 11 further including comparing the first gain to a maximum gain and a minimum gain, wherein the maximum and minimum gains define upper and lower device limitations of the repeater, respectively.

15. The method of claim 11 wherein the reference signal is selected to optimize a maximum coverage area of the repeater without degrading a coverage area of the transceiver.

16. A self-configuring repeater for use in a telecommunications network, the repeater operable to receive data from a base station via a downlink channel and to send data to the base station via an uplink channel, the repeater comprising:

a first amplifier chain operable to apply a first gain to a first signal received via the downlink channel;

a second amplifier chain operable to apply a second gain to a second signal to be sent via the uplink channel; and

a comparator accessible to the first and second amplifier chains, the comparator operable to compare a power level of the first signal to a reference power level, adjust the first gain so that the power level of the first signal falls within a predetermined range of the reference power level, and adjust the second gain to equal the first gain.

17. The repeater of claim 16 further including a gain balancer, the gain balancer operable to equalize the first and second gains.

18. The repeater of claim 17 further including:

a first and second antenna;

a first switch positioned between the first amplifier chain and the first antenna;

and a second switch positioned between the second amplifier chain and the second antenna, the first and second switches operable

to prevent a balancing signal generated by the gain balancer from being transmitted via the first and second antennas.

19. The repeater of claim 16 wherein the first amplifier chain includes at least a first amplifier, a first attenuator, and a test point and wherein the second amplifier chain includes at least a second amplifier and a second attenuator.

20. The repeater of claim 16 wherein the comparator is further operable to demodulate the first signal.